

## ESRI (UK) and the public sector

Having worked extensively with central and local government for a number of years to introduce effective geographic information systems, ESRI (UK) has a in-depth understanding of the barriers and challenges the public sector faces in the use and sharing of information. This understanding has proved invaluable in our work both to introduce these core standards and to help individual authorities and departments address their geographic information needs.

Our approach is always to deliver a GIS that not only meets the specific applications needed, but that can also be rolled out further to the benefit of the whole organisation.

For more information on ESRI (UK), our solutions and our work within the public sector, visit [www.esriuk.com](http://www.esriuk.com)

# Geography: Enabling the Business of Government



An ESRI (UK) White Paper

<u>Executive Overview</u>	1
<u>Improving services for the citizen</u>	2
Increasing the accuracy of the analysis	2
Example 1: Planning where to place health services	3
Example 2: Planning local services in Hammersmith and Fulham	3
<u>Improving the way citizens interact with government</u>	4
Example 1: Environmental reporting at Braintree District Council	5
Example 2: Delivering information about local services	5
Example 3: Accessing national information from the Environment Agency	5
<u>Streamlining business processes</u>	6
Example 1: Putting geography at the heart of the Forestry Commission	7
Example 2: Reducing supplier costs at the London Borough of Bexley	7
<u>Delivering shared services</u>	8
Working together locally	8
Reducing business regulation	9
<u>Conclusion</u>	9
<u>ESRI (UK) and the public sector</u>	10

From the heart of Whitehall to devolved administrations, from local authorities in Cornwall to the ward of Caithness, Government depends on geographic information.

For improving services, and for delivering the levels of personalisation that are increasingly sought and expected, it is essential that Government understands what is happening and where. What services are available in a particular location? Where do their users come from? Who would benefit from changes to the location of those services?

In answering any of these questions, geographic information can prove invaluable.

This paper demonstrates how GIS can be used as an analytical tool within the public sector and shows the benefits that local, regional and central government can gain by making more strategic use of GIS.

Geography, after all, not only enables government organisations to consolidate statistical information and present an aggregated view in an intuitive map-based format; when used to its full potential, geography

can empower policy making and implementation. It provides government with a hugely powerful analytical tool that can help generate a fuller, more realistic picture of service provision, activity levels or citizen needs.

This greater understanding leads, in turn, to service improvements for the citizen, aligning provision more closely with demand.

At the same time it can provide the basis for enhancing and streamlining business processes, so that maximum use can be made of precious resources.

Currently, however, many government organisations are not gaining these value-added benefits from geographic information. This is because the computer systems designed to use and manipulate geographic information – Geographic Information Systems (GIS) – are often consigned to the back office for the compilation of data and the production of maps.

These systems are certainly of value, of course. But they are arguably far too limited. For example, such solutions do not deliver the insight and analysis necessary to help with policy development, service planning or resource management.

Drawing on the experiences of ESRI (UK)'s own customers and the work they're doing, this paper underlines the impact that increased use of geography and location can bring to government. From healthcare planning to forestry management to transport provision, in central government and local authorities, geography is helping to cut costs, deliver more personalised services and make it easier for citizens to access the government resources and information they need.

Moreover, as citizens become more accustomed to personalised service provision and improving levels of service from the private sector, so expectations on the public sector are ever increasing. Alongside these examples, therefore, are selected case studies from the private sector that serve to demonstrate the potential benefit of much broader adoption of geographic analysis to support a wider range of government work and to meet government efficiency objectives. These range from those set out in the Gershon Review, to the more recent Varney Report on service transformation.

This paper, then, demonstrates how geography can be used as an enabling tool within the public sector, and shows the benefits that local, regional and central government can gain by making more strategic use of geographic information.

How can technology best be used to deliver 3% efficiency savings? The recent Comprehensive Spending Review has put questions of efficiency firmly at the forefront of government thinking. With the right GIS solution, geography can make the business of government very much more efficient. They can, for example, enable authorities to increasingly interact with citizens via the web.

# Improving services for the citizen

No objective is more important to government, at all levels, than improving the services provided to citizens. Geographic information – managed by GIS systems – is a major asset. It delivers the insights needed to create more personalised public services, and makes it easier for the public to view, understand and act upon government information and knowledge.

The recent policy review document, *Building on progress: Public services*<sup>1</sup>, articulated an irrefutable case for increased personalisation in public service delivery, and argued for greater targeting at every level. But in many ways, this argument was an easy one to make. It is, after all, widely acknowledged that, in the ideal world, public services should be delivered where they are needed most.

The challenge is working out where is, exactly, the place of greatest need.

Until recently, this has been an imprecise science, often leading to areas of over-provision and under-provision, and not making best use of government resources. Using geographic information, those problems can be tackled head on.

By pulling together multiple datasets, government can identify the areas of greatest need. And so decide where to locate welfare, health services or education facilities that might involve basic demographics such as age and gender profiles, alongside lifestyle trends, income levels and details of existing provision and usage. These can then be projected forward, based on existing knowledge to assess how the demographic and service demand might change in ten or twenty years.

To take a different requirement – a planning decision in a rural area – the information involved could include existing land use, population levels, liability to flooding, commitments to maintaining green belt areas and many other factors.

In each case, the geographic information doesn't make the decision, but using GIS to analyse the information helps create a fuller understanding of the service needs.

## Increasing the accuracy of the analysis

A similar approach could apply to almost any government service. For example, JobCentre Plus, part of the **Department for Work and Pensions**, used GIS to more accurately target its advertising at people they wanted to help back to work. But in using GIS to facilitate decision-making, the key is to draw in as much information as possible to make the picture as realistic as possible. So, for example, when making planning decisions about government resources such as schools, health centres or courts, GIS systems can augment information about where potential visitors live with data about journey times, proximity to public transport or other related services and even locations to avoid. It may not be appropriate, say, to situate a benefits office next door to a betting shop.

Much of this approach – and indeed, the data itself – would be invaluable in deciding where to situate youth services. Or consider the value to regional development of using this kind of analysis to identify what kinds of businesses might thrive in particular locations, and then targeting investment and promotion based on this insight.

In all these cases, the result, quite simply, would be more focused, more personalised and more efficient service provision.

## Example 1 Planning where to place health services

The **Department of Health Estates and Facilities Management** team has invested in the development of a web based GIS driven solution that supports the local investment decisions for new and existing health facilities.

The principles are simple: by comparing demographic information (based on key local population census profiles for age, economic status, etc) with details of existing provision, the Strategic Health Authorities (SHAs) and local Primary Care Trusts (PCTs) can plan for current and future health needs. The evidence for such investments is essential in order to show equality of access for a local population, whether young or old, where the right services are in the right place and can adapt for tomorrow's changing needs.

The role of the GIS solution is to visualise and prioritise the different combinations of the multiple data sets to highlight areas of specific health need in relation to current and planned service provision, from small clinics to general and specialised hospitals. Decision makers can literally see on a digital map how a specific population's health need is matched with access, however many minutes away by walking or transport, from the services needed or planned. The apparent gaps and duplication can then be investigated and the necessary amendments made. Another crucial factor in planning service delivery is the ability to create centres of excellence for specific needs. So, rather than assuming each hospital would have a specialist ophthalmology clinic, for example, resources could be focused on a particular centre using the population demographics to show where the best location is.

This already happens to an extent, with A&E departments available at some, but not all hospitals. Where GIS delivers is in its ability to identify the services that are needed most in each area, based on demographics, and availability of similar resources elsewhere. The result is a far more integrated approach to long-term planning – and a much better use of NHS budgets based on evidence.

## Example 2 Planning local services in Hammersmith and Fulham

Personalised service provision depends on understanding your customers: citizens. As the **London Borough of Hammersmith and Fulham** has proved, GIS is a vital tool in gaining this understanding.

Putting residents first is the Council's overriding priority and the Residents First vision is to provide a faster, more reliable service to all residents. This means improving access to council services so that residents can contact the Council in ways that suit them best.

Demographically, the borough is exceptionally diverse. Recognising this difference, the council sought to differentiate the way it provided services. Working with its strategic partner, the H&F Bridge Partnership (HFBP), the Council commissioned detailed customer insight work including the breakdown of services used by customers, individual access channel preference, and geographic location. This identified twelve discrete segments of customers, each with their own unique preferences and expectations of Council services.

For each customer segment HFBP identified a set of service improvement priorities. At the heart of the approach has been a simple but rigorous commitment to use customer insight to inform both the strategic questions posed and the method through which they were answered.

The GIS-based analysis has changed much in Hammersmith and Fulham. The authority can now plan the location of different centres and potentially target information campaigns (e.g. door drops) right down to postcode level. They can also prioritise their wider service transformation programme (as part of Transformational Government) to deliver the right services online, quickly.

The result of all this is clear to see. By understanding its customers, this particular authority has been able to design and deliver targeted services where they are most needed. That, in turn, means that the Council not only supports citizens better but also increases its own operational efficiency.

<sup>1</sup> Cabinet Office – *Building on progress: Public services* (March 2007)  
[www.cabinetoffice.gov.uk/policy\\_review/documents/building\\_on\\_progress.pdf](http://www.cabinetoffice.gov.uk/policy_review/documents/building_on_progress.pdf)

# Improving the way citizens interact with government

Driven by their experience of private sector services such as online banking, shopping and even traffic information, citizens today expect to be able to interact with government online – and expect those interactions to be as simple and effective as they would be in the private sector. GIS can help deliver the service levels and experience that citizens demand.

Most local authorities provide facilities to report incidents such as abandoned cars or other environmental issues online. However, in many cases these facilities ask the citizen to describe in detail where the incident is. This process could be made far easier if the citizen simply pinpointed the location on a map.

In many cases, the ability to link a variety of information to a specific location – often a postcode, but potentially an individual property or area of land – is helping to provide a more effective service to the public. Behind the scenes, the tools enabling this are GIS. The key to unlocking its potential here is to make the front-end – the map-based query tool – available online: then work out what information the public may want, and how they may want to use it. In this way, even more services can be delivered online, or enhanced.

## Example 1 Environmental reporting at Braintree District Council

**Braintree District Council**, in Essex, is using ESRI (UK)'s innovative web based LocalView solution to enable residents to report road and pavement defects, missing or damaged road signs, flooding, fly tipping, graffiti or dangerous dogs either using a traditional form or by pointing to the location on a map – right down to an individual address level.

The information from the local residents is sent directly to the customer contact centre, which replies by sending back a unique reference number, allowing the citizen to trace their request. If they provide a contact email address, customer advisors can respond to them with details about when the fault is due for repair or how the problem will be addressed.

Alternatively, when citizens call the contact centre, agents are able to use the same application themselves to help record details of the incident, so simplifying the process and making sure citizens receive the highest levels of perceived service.

## Example 2 Delivering information about local services

Local authorities could consider following the example of private sector organisations to deliver information about a locality to citizens.

When **Nectar** loyalty card holders move house, for example, the company sends a home movers' pack full of information about the local retailers in their area, crucially including a map to show the proximity of services. The service is personalised to the customer's spending profile often including vouchers and other incentives to visit the retailers.

Local authorities could do something very similar. A 'new resident' pack might include details of the location of healthcare services, the local councillor, transport, parks, libraries, youth services and much else in the area. It would be a very public embodiment of the joined-up approach demanded in the Varney report and potentially could lead towards the integrated 'Tell Us Once' service, around significant life events, that the public sector as a whole is seeking to deliver.

## Example 3 Accessing national information from the Environment Agency

It is not just local government that can improve the way they present information to citizens.

**The Environment Agency**, for example, has used ESRI's GIS platform to develop an online application called "What's in your back yard?" ([www.environment-agency.gov.uk/wiyby](http://www.environment-agency.gov.uk/wiyby)). Citizens can enter their postcode and see the risk of flooding in the area, what air and water pollution there may be, where waste goes in the area and much more. The information can be shown on a map, or as simple text, helping prepare citizens for floods – information is updated regularly and flood alerts shown – and is also proving useful in making decisions about buying or selling property. The site has proved extremely popular already.

# Streamlining business processes

The analytical capabilities of GIS don't just help in service planning. They can also help to optimise existing services, creating efficiencies and reducing duplication of effort. In fact, it is by putting GIS at the heart of operations, managing processes, activities and workflow, that the greatest benefits can be realised.

For example, GIS empowered route planning for government staff could be used to increase their efficiency – and potentially reduce their carbon footprint.

From health visitors and district nurses, to health and safety inspectors at local or national level, many public sector employees spend their days making site visits. Using GIS to plan work schedules could help ensure these staff make best use of their working day and cut down travel time.

In any command and control scenario, such as the fire service, police or incident response teams, GIS is also a valuable asset: while a particular team may be geographically close to an incident, there may not be an easy or quick route there. That's why the fire service in particular is adopting networked service provision, where resources from the next county may be nearest to a fire, and best able to respond, rather than expecting each county to operate as a standalone service.

Meanwhile, as emergency planning is increasingly understood to be a core responsibility for all government departments, another significant use of GIS comes to the fore: mapping where staff live and their routes into work. So if a particular location or transport route is affected, the hospital should be able to contact on-call staff who would come to work using a different route.

**Daventry District Council** has saved £115,000 per year through managing the routes its refuse lorries take. This reduced mileage by 12%, eliminated overtime, decreased environmental impact and increased capacity.

## Example 1 Putting geography at the heart of the Forestry Commission

If there's one example of a government body that has fully embraced the potential of GIS to streamline processes, it is the **Forestry Commission**. As the organisation responsible for managing and regulating almost 12% of Britain's total land area, the Forestry Commission's entire business depends on geographic information.

The Forestry Commission directly manages more than one million hectares of publicly-owned land. At the heart of all its operations is the overall stock map, showing how land is used, what types of tree are where and how mature the woodlands are. This stock map enables the Forestry Commission to create an accurate model of how its forests will look in the future, which in turn helps them to plan activities, from felling to planting and path clearing. It means that the woods are accessible to the public, they retain biodiversity, and they remain a source of income, through timber sales.

Following its decision to make ESRI's GIS platform a main operational tool, the Forestry Commission now plans activity through GIS, equips foresters with devices that enable them to record activity – and so constantly update the stock map – and then uses all this information to manage the forests at both a micro and macro level.

The information is also made available to the public: on the Forestry Commission website, citizens can enter their nearest town or forest and can find out about forthcoming events, animal habitats, cycle paths, picnic sites and much more. The site links directly to maps of the area, enabling citizens to plan activities, and even view weather forecasts.

## Example 2 Reducing supplier costs at the London Borough of Bexley

One of the most obvious ways to increase efficiency within local government is to reduce costs, particularly the costs of services provided by third party contractors. For example, using a school transport application from Trapeze, the **London Borough of Bexley** was able to dramatically reduce the costs of its school transport provision. This was because when the Borough re-tendered the taxi service, it could identify precisely the resource required to transport pupils from home to school and back again.

The ESRI GIS element of the Trapeze application helped the London Borough of Bexley plan each route and calculate the mileage by using the home and school addresses of each pupil who required taxis. Clearly, this would change throughout the year as pupils moved, but it meant that the Borough could allocate runs to the most cost efficient taxi provider.

# Delivering shared services

Government continues to strive to deliver better, more shared services. These shared services need to be delivered electronically, harnessing the power of the internet to create a seamless value chain which overcomes the silo working generated by traditional departmental boundaries.

Geographic information was fundamental to the delivery of an early shared service, the Multi-Agency Geographic Information for the Countryside (MAGIC) portal. An interactive map tool designed to support the policy development and management of different government organisations who all have responsibility for rural areas,

The directive for an Infrastructure for Spatial Information in Europe (INSPIRE) is almost upon us. It came into effect this year and will be transposed into our law in 2009 becoming the foundation for facilitating the sharing of geographic information within the public sector where there is likely to be an impact on the environment.

Whereas organisations currently have laudable aims to share information, INSPIRE will really drive this home with recitals that will standardise metadata and interoperability.

Though this service seems to function well, it hasn't proved to be the catalyst for shared services that many expected it to be. The reasons are hard to identify, but perhaps the fundamental answer lies in the fact that working out how to fund a shared service is often complex: does the service provider offer the service at its own expense, or do the user organisations pay to access it?

MAGIC enables policy and decision-makers to examine land use, down to postcode level. This, in turn, facilitates decisions about planning and investment.

For example, through MAGIC, it is easy to identify Sites of Special Scientific Interest (SSSIs): this information can then be used by the Department for Transport in planning roads, by local authorities in considering whether or not to grant planning permission, or by Defra in licensing particular types of farming close to an SSSI.

A set of established standards already exists for sharing geographic information – standards that most local authorities, and many central government organisations, have already met. Data from different applications can be shared. All ESRI software, for instance, is based around recognised GIS standards such as those developed by the Open Geospatial Consortium. What this ultimately means is that the information contained in ESRI GIS platforms can be shared not only with other GIS tools, but other enterprise software such as reporting and customer relationship management applications as well as many corporate databases.

## Working together locally

A project in Lancashire is proving an excellent model of how these difficulties can be overcome.

Like almost every other area of the country, Lancashire is served not only by multiple local authorities (nine borough councils, two city councils, one district council and the county council) but also by local emergency services, various primary care trusts and a range of other public sector organisations – all of which have different boundaries and jurisdictions. Yet all of those involved can essentially benefit from the same information about the county: demographics, land use, crime information, location of key facilities, etc. More importantly, they recognise that the more information they have on these issues across not only their zone, but the whole county, the more valuable that information becomes.

The result was the development of Red Rose Maps, a collaboration which delivers GIS services to the whole of Lancashire and allows staff at any of the partner organisations to view and make use of a wealth of statistical and map-based information about the county. The services are delivered online and centrally, removing the need for each council to invest in its own GIS platform. What's more, because each council sees the benefit of this unified information source, the project is entirely built on joint funding.

Now, not only do council workers use maps to help them plan workload, make planning decisions and examine core services, but the different parties involved in a Local Area Agreement – such as healthcare trusts, social services and third sector organisations, as well as police and the local authority – can identify problems. For instance, particular anti-social behaviour hotspots are easier to highlight: each party records the location of an incident on the central database. Even if the incidents themselves aren't connected, it is then possible – based on the unifying fact of their geographical location – to identify where interventions may be needed, and which organisation (police, social services or another trusted partner) would be best placed to deal with the issue.

The information and resource has also been extended to the public, through Maps and Related Information Online (MARIO), a web portal which enables citizens to search for details about their local area, from location of bus stops to the location of speed cameras. This service was described by Socitym as "excellent."

## Reducing business regulation

The logic of the Red Rose approach is clear: joining up information, using location as the connecting factor. The challenge, then, is to work out where and how it can be applied. One possibility could be in responding to the Hampton Report on reducing business regulation. As the

report noted, in many cases businesses receive multiple government inspections and have to provide the same information to several different government bodies. The report echoed the sentiments of businesses everywhere when it recommended finding ways to cut this administrative burden.

Geographic information provides an obvious solution, because of the way it can combine information. When the **Health and Safety Executive**, for instance, conducts an inspection of a manufacturing plant and identifies potential release mechanisms in the use of hazardous chemicals, this information could help the **Environment Agency** anticipate or tackle water pollution downstream. Instead of duplicating inspections, a more joined up service, based on this kind of information would enable inspectorates to target their interventions more intelligently.

Similarly, the geographic information held about a farm, say – its size, its type of business and even the funding it receives – could be shared from one inspection to another. The second inspectorate don't have to ask for the information again, and could even make decisions based on the information that already exists.

GIS works here because it identifies businesses precisely in different ways: their name, but also their exact location. A shared service based on delivering GIS information may reduce misunderstandings, reduce the burden on citizens and reduce the workload of the inspectorates.

## Conclusion

In some cases the link between geography and government is intuitive and plain to see – as it is in the case of the Forestry Commission for example. However, as has been pointed out throughout this paper, the majority of government work ultimately refers to a person or a location.

Whether location-based information is used to make better use of staff, reduce contract costs, or even identify lost revenue (such as benefit fraud, through spotting clusters of claimants in high income areas), the fact is that GIS can and does help streamline the organisation and generate demonstrable efficiencies.

Facilitating information sharing and analysis based on geography requires a change in mindset. The crucial role geography has to play must become increasingly acknowledged and so ensure that every incident and event includes a geographic reference.

The key to strategic success is to tap into this information and identify how best to harness it to deliver improved services and greater operational efficiency. What is clear is that by evolving the way that geographic information is regarded, GIS has an enormous potential to become a powerful enabling tool for policy development and strategic decision-making throughout both local and central government.